



Astrosat and CASTOR

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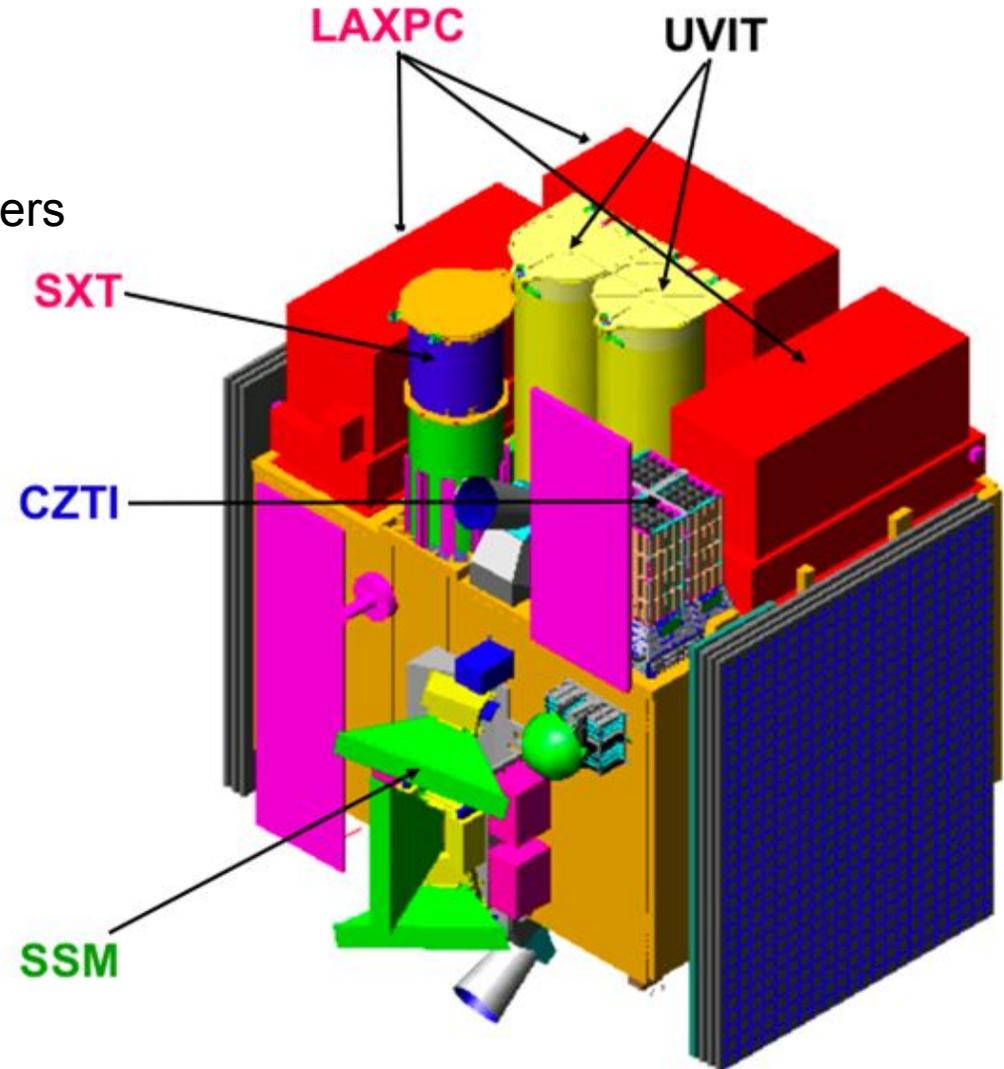


ASTROSAT – ISRO observatory



Co-aligned and working together:
2 UV telescopes, 3 channels
Soft X-ray foil Telescope
3 Large high-energy proportional counters
Coded mask hard X-ray telescope

Scanning sky monitor





Assembled Astrosat in ISRO cleanroom

Sept 20 2015 launch date





<i>Instruments</i>	<i>PV Phase (6 months)³</i>	<i>Guaranteed Time (next 6 months)⁴</i>	<i>First Year Regular observations</i>	<i>Second year Regular observations</i>	<i>Third year Regular observations</i>
X-ray Inst. Teams	67%	4 months	32.5%	20%	-
UVIT Teams	33%	2 months	17.5%	10%	-
Indian proposals	-	-	35%	45%	65%
International proposals	-	-	-	10%	20%
CSA Team ¹	-	-	5%	5%	5%
LU Team ²	-	-	3%	3%	3%
TOO	-	-	5%	5%	5%
Calibration time	-	-	2%	2%	2%

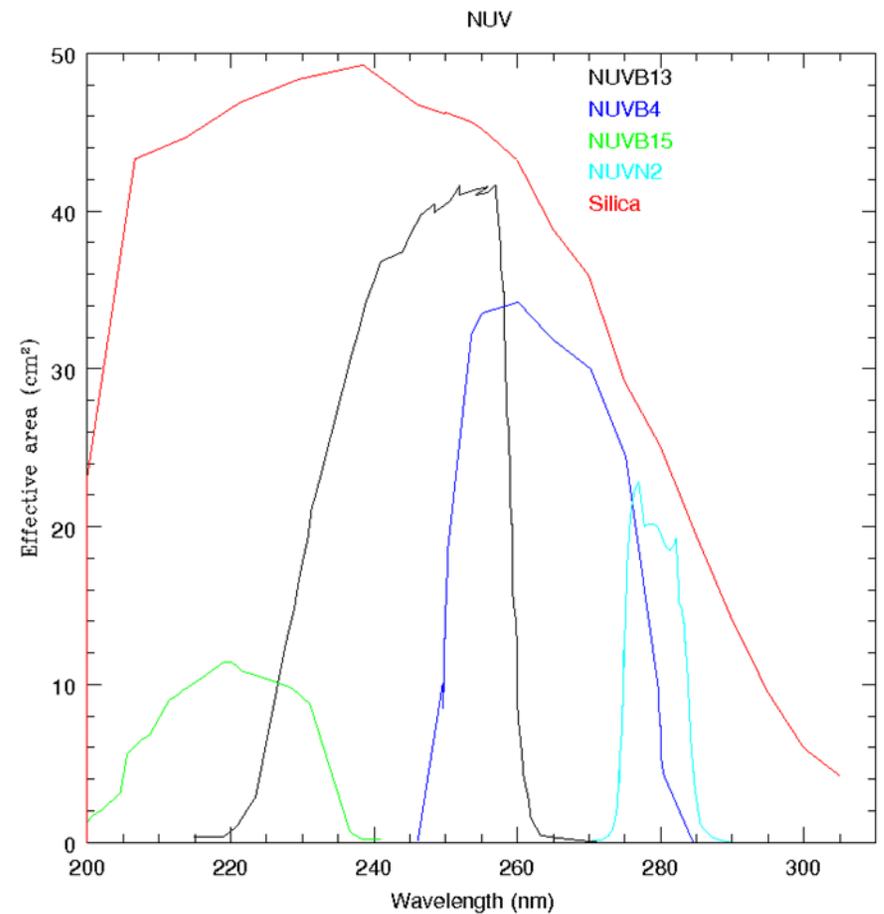
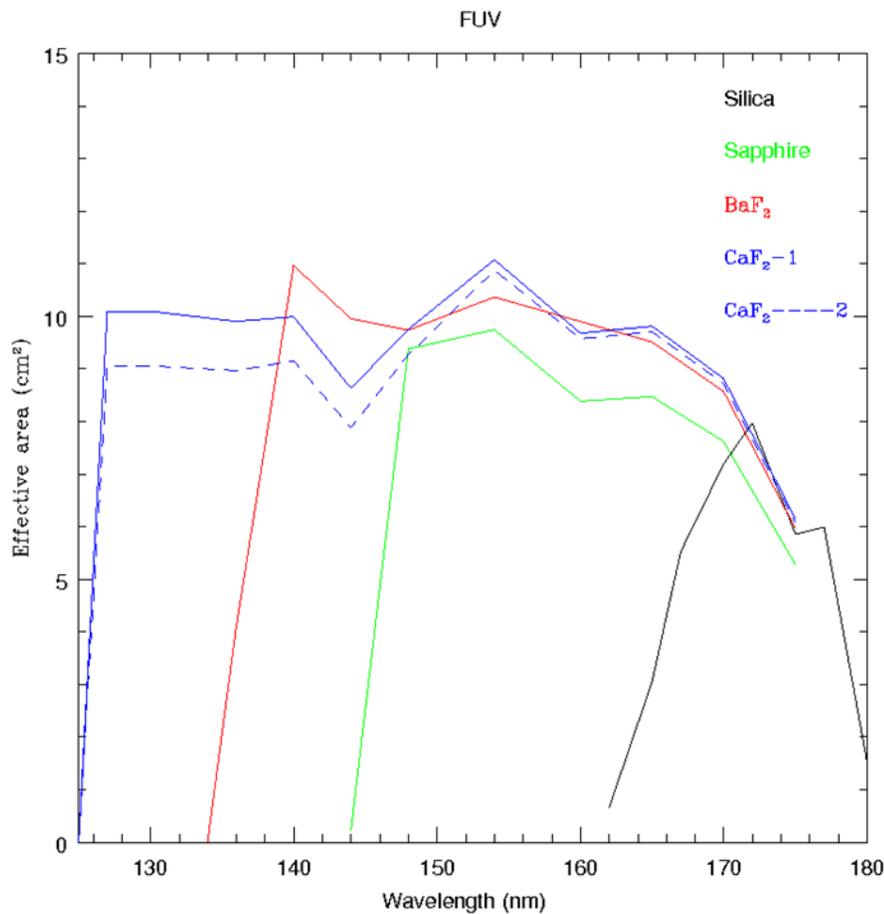


UVIT capability

Half-degree FOV; FUV, NUV, Blue simultaneously; filters and gratings

Channel	FUV	NUV	VIS
Best FWHM (")	1.1	0.9	0.9
Worst FWHM (")	1.2	1.2	1.1

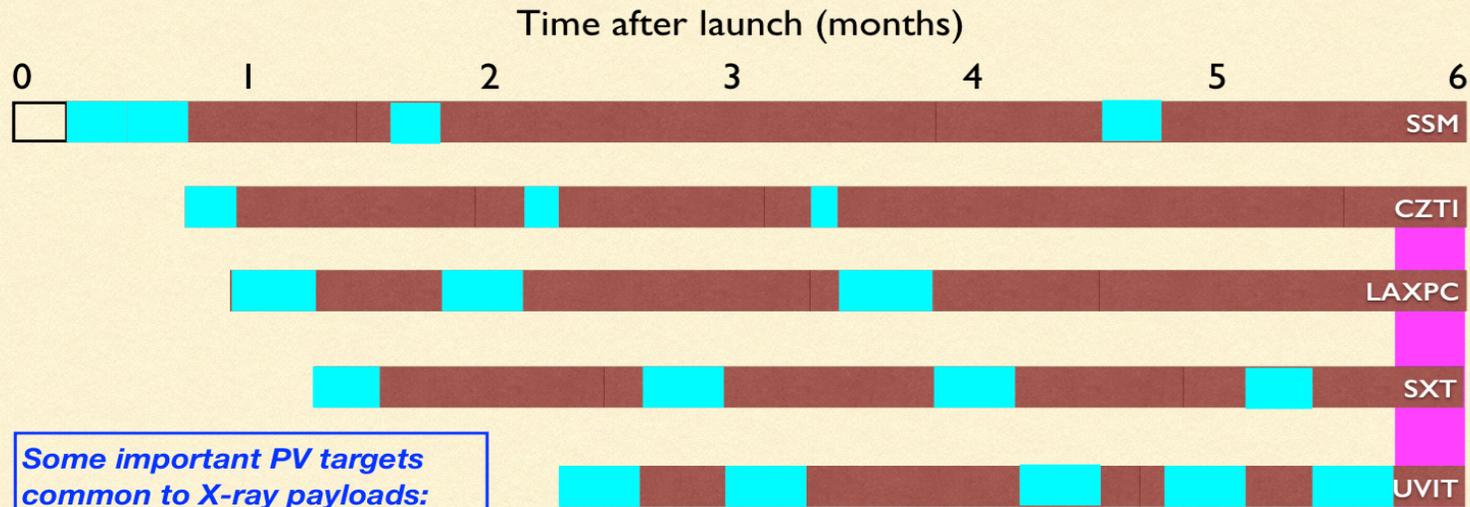
With these values, the gratings give $R \sim 100$ and 200 for first and second order.



	Main activities 6 am to 10 pm	Parallel activities 10pm to 6 am
11-12 May	PSLV match mating (Cleared by studies and measurements), Phase 1 Alignment	
13 May to 4th June	Assemble Mode IST	Pre thermovac Alignment and corrections Thermal blanket preparations TV test preparations
11th June to 28th June	Thermovac at CATVAC , ISITE (CATVAC to be available for facility Preparation)	
29th June to 4th July	Spacecraft baking (period being discussed)	
5th July to 20 th July	Transportation back to ISAC Solar panel assembly , Alignment phase 2, preparation for dynamic tests including Simulated propellant loading	
21th July to 31th July	Transportation to ISITE Vibration tests	
1st Aug to 9th Aug.	EMI/EMC tests, Acoustic tests, preparation for transportation	
10 th Aug	Transportation to SHAR	

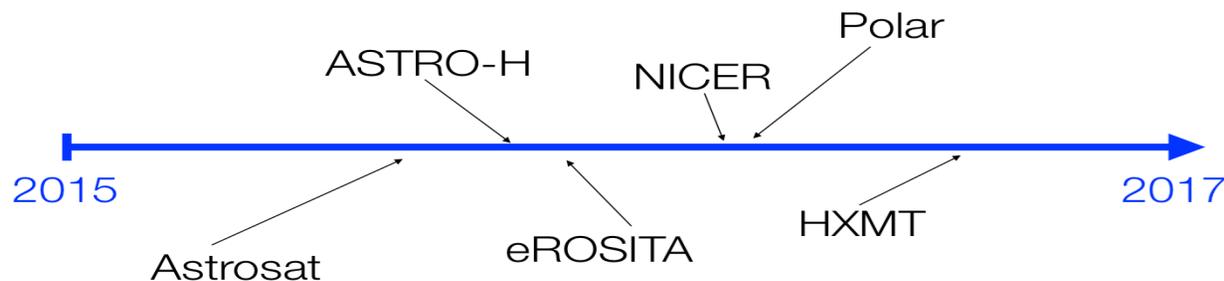


ASTROSAT PV phase schedule



Some important PV targets common to X-ray payloads: Crab, Cas A, Cyg X-1, Cyg X-2, Vela X-1, 3C273, Mrk421..

- Request short (~1ks), simultaneous SWIFT observations of selected bright targets from ASTROSAT PV phase list
- Will plan ASTROSAT observations concurrent with scheduled NuSTAR targets - request collaboration for calibration
- Post-PV, will participate in periodic multi-mission calibration campaigns



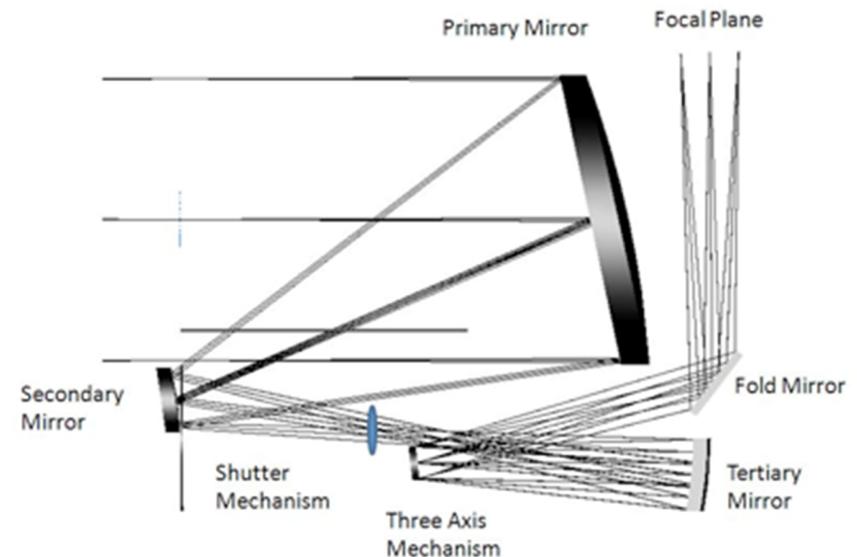
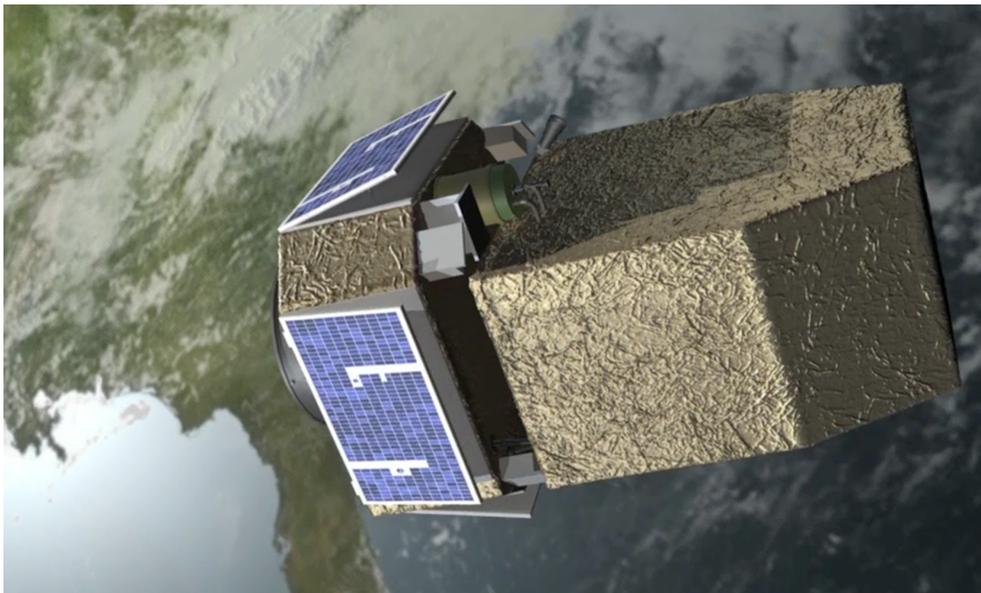
X-ray mission Timelines. Coordinated calibrations



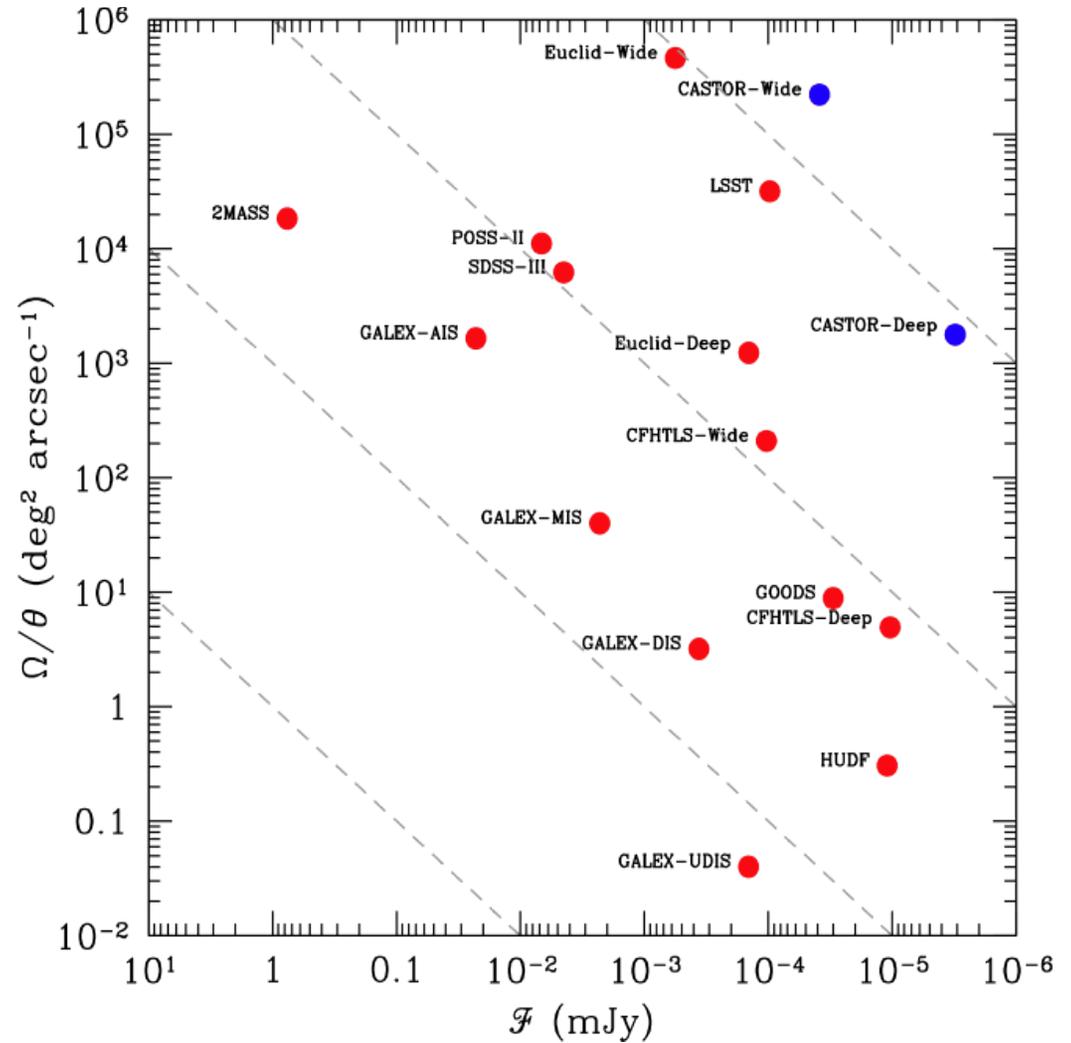
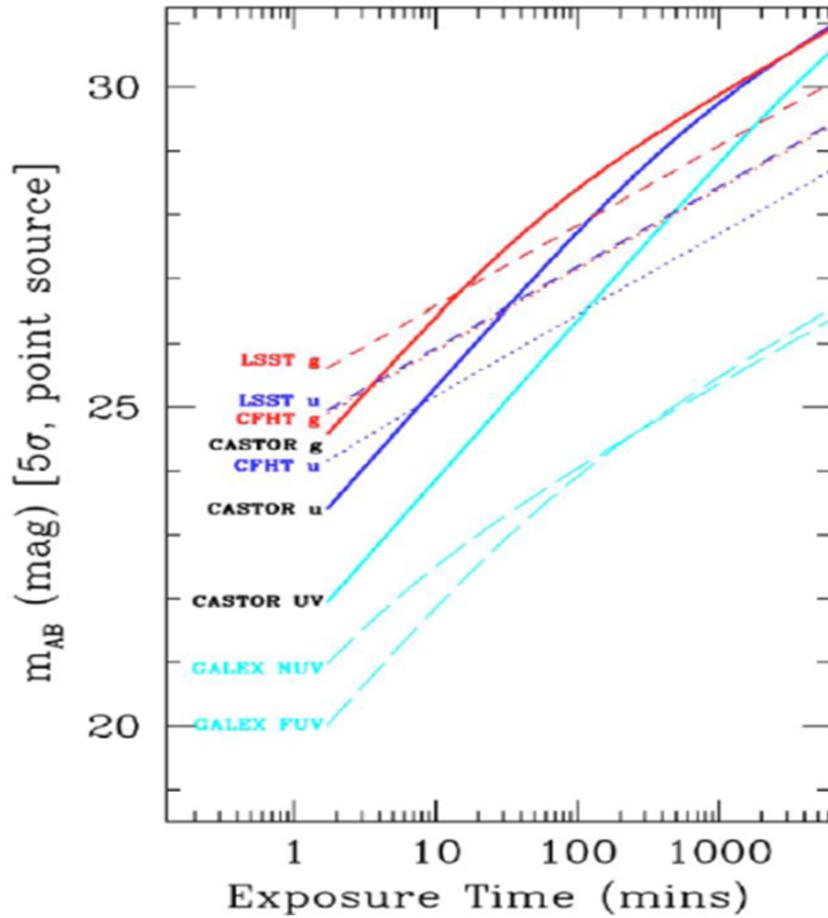
CASTOR – the next step



- A 1-m diameter unobscured Three Mirror Anastigmat telescope provides Hubble-like image quality of $<0.15''$ over an unprecedented $1.16^\circ \times 0.58^\circ$ field of view.
- A 725 Megapixel camera with wavelength coverage from 150-550 nm allows access to wavelengths not visible from the ground.
- Surveys an area of 5,000 deg² in <2 years, due to the high efficiency operations.
- The aperture provides u-band Wide Survey sensitivity of >27 AB magnitude



Some performance plots for CASTOR





CASTOR status

1. Concept study completed – significant detail
2. Detector array study and prototype under way
3. Optical-mechanical design to follow, this year
4. Science definition study this year

Survey discussions with Euclid

WFIRST possible survey support

Coordination with other groups: Messier, ISRO

Significant partnership welcomed

Launch in early 2020s desirable

Fills the gap between Astrosat, HST, New UV flagship